

software, new data elements can be added simply by updating the Data Dictionary.

**[0107]** The Data Dictionary Model is the sum of each of these afore-mentioned individual elements which are described in more detail below. It should be noted that the following description is in the context of the exemplary embodiment and that it will be apparent to one skilled in the art how to customize the data models and Data Dictionary for other implementations of physical networks that can be represented by anchor sections and linear referencing methods.

#### *The Road-Division Data Model*

**[0108]** The Road-Division Data Model provides two parallel views of the road network: (1) a division-level view that depicts the road network as a collection of Division Sections, each representing a linear section of a physical division of a road, and (2) a road-level view that depicts the road network as a collection of Road Sections, each representing a linear section of a road. Both Division Sections and Road Sections are representations of the more abstract Anchor Section. Figure 3 illustrates that a single actual road network 300 can be represented in both road section form 310 and Division Section form 320. These two views of the road network are implemented using the following road network Entities (see Figure 12).

**[0109]** Referring now to Figure 12, there is shown a block diagram overview of the Road Division Data Model, as described below:

- [0110] Division Section.** A Division Section 1210 represents a linear section of a physical division of a road. For a divided roadway, each division should be represented by a series of Division Sections that join end-to-end to represent the entire road division. An undivided roadway is represented as a single division. The places where Division Sections physically intersect are represented by Division Nodes 1211. Each Division Section is an Entity (as defined hereafter), and therefore has a unique ID and associated Attributes that can be used to associate values to positions in the road network.
- [0111] Division Node.** A Division Node 1211, which may occur at either end or in the interior of a Division Section, represents the physical intersection between two or more Division Sections. The ability to represent an interior intersection (i.e., interior Node) without re-segmenting the Anchor Section (e.g., Division Section or Road Section) is a significant advantage of the system over the prior art.
- [0112] Division Intersection.** A Division Intersection 1212 represents an intersection (e.g., a simple at-grade crossing, a complex interchange) between two or more roads. Each Division Intersection 1212 is an Entity and, therefore, has a unique ID and associated attributes that can be used to associate values to the intersections in the road network.
- [0113] Division RCLink.** A Division RCLink 1222 defines the primary name and mileage references for each section of road-division in the road network, establishing a milepoint-based linear referencing method for the road divisions.

Each Division RCLink 1222 is an Entity, and therefore has a unique ID and associated attributes that can be used to associate values to the road-divisions in the road network.

5      **[0114] Anchor Mileposts.** Anchor Mileposts 1220 define the physical location of mile posts along the road network. When combined with RCLinks 1221, 1222 (or other Traversals), mileposts establish an alternative linear referencing method.

10      **[0115] Road Section.** A Road Section 1230 represents a linear section of a physical road. Each Road Section is an Entity, and therefore has a unique ID and associated attributes that can be used to associate values to positions in the road network. Road Sections are only defined for through roads (i.e., not for ramps, collectors, and distributors).

15      **[0116] Road Node.** A Road Node 1232, which may occur at either end or in the interior of a Road Section 1230, represents the physical intersection between two or more Road Sections 1230.

20      **[0117] Road Intersection.** A Road Intersection 1231 represents an intersection (e.g., a simple at-grade crossing, a complex interchange) between two or more roads. Each Road Intersection is an Entity, and therefore has a unique ID and associated attributes that can be used to associate values to the intersections in the road network.

**[0118] Road RCLink.** A Road RCLink 1221 defines the primary name and mileage reference for each section of road in the road network, establishing a